ASPECTS OF HUMPBACK WHALE, *MEGAPTERA NOVAEANGLIAE*, CALF MORTALITY IN QUEENSLAND

H.A. JANETZKI AND R.A. PATERSON

Janetzki, H.A. and Paterson, R.A. 2001 12 31: Aspects of humpback whale, *Megaptera novaeangliae*, calf mortality in Queensland. *Memoirs of the Queensland Museum* **47**(2): 431-435. Brisbane. ISSN 0079-8835.

The Queensland Museum has records of 19 humpback whale *Megaptera novaeangliae* calf mortalities. The cause of death in the majority was not determined. Three resulted from shark net drowning; two from shark attack and one from boat strike. Killer whale, *Orcinus orca*, attacks on calves are considered to be an uncommon cause of death in southern Queensland waters. ❐ *Humpback whale, Megaptera novaeangliae, calf mortality, Queensland.*

Heather A. Janetzki & Robert A. Paterson, Queensland Museum, PO Box 3300, South Brisbane 4101, Australia; 16 August 2001.

Humpback whale, *Megaptera novaeangliae*, calf specimens in the cetacean collection of the Queensland Museum and other recorded but not collected animals (Table 1) included 6 males, 5 females and 8 of unknown gender. All but two records post-date 1980. This is considered to have resulted from a greater capacity and interest in acquiring such specimens for museum collections, and recovery from low numbers following over-exploitation after the Second World War (Chittleborough, 1965).

MIGRATION

TEMPORAL AND SPATIAL FACTORS. Most humpback whale calving on the east Australian coast is considered to occur in sheltered waters (18°-21°S) of the Great Barrier Reef during August and September (Simmons & Marsh, 1986; Paterson, 1991). In the small sample (Table 1), when accidental death such as boat strike and shark net drowning is excluded, 8 of the 15 deaths occurred in southern Queensland from late June to mid-August. One of us (RAP) has conducted a long-term study (Paterson et al., 1994) of the recovering east coast humpback whale stock from Point Lookout (27°26'S, 153°33'E) and Cape Moreton (27°02'S, 153°28'E). In 1999 as a continuation of that study both the northern and southern migration phases were observed. Most mother/calf pairs were seen at the end (October/November) of the southern migration (Fig. 1), a finding consistent with those of Chittleborough (1965) and Dawbin (1966, 1997). However, small numbers were seen in July during the northern migration indicating that occasional calving occurs at latitudes higher than Point Lookout. The mortality in July (Table 1), particularly in 1999, seems disproportionately high but in the present state of knowledge it is impossible to attribute a specific cause, such as prematurity, to this. However, it is likely that calf mortalities in Queensland waters will increase as the population is increasing at ~10% per annum (Bryden et al., 1990; Paterson et al., 1994).

PREDATION. Two calves are considered to have died from shark attack (Paterson & Van Dyck, 1991; Paterson et al., 1993) although it is unknown if they had a constitutional condition which predisposed to predation. Protective gill nets set at surfing beaches along the Queensland coast since 1962 resulted in capture of 30,630 sharks until 1988 (Paterson, 1990) and the program is continuing. Whether the resultant regional captures of sharks have the potential to diminish attacks on humpback whale calves is debatable but will be a factor of interest in future studies. Killer whales, *Orcinus orca*, are also a natural predator of humpback and other baleen whales (Corkeron & Connor, 1999; Mead, 1963). During 931 viewing days from 1978-99 RAP observed 8,086 humpback whales passing Point Lookout or Cape Moreton and saw killer whales on only six occasions, including an attack on humpback whales on 10 October 1999 (Paterson & Paterson, 2001). Two attacks were photographically recorded by others on 19 October 1990 and 6 October 1998 and all three occurred within 3km of Point Lookout (Table 2). No remains washed ashore which is not surprising, given the combination of predator efficiency and prey non-buoyancy (Guinet et al., 2000). The attacks occurred in October when the majority of mother/calf pairs migrate through southern Queensland waters (Fig. 1). While opportunities exist for killer whales to attack humpback whales at other Queensland locations and at times not

TABLE 1. Queensland Museum records of humpback whale calf mortality.

Reg. No.	Date	Location	Length (m)/Sex	Cause of Death
-	1950s (winter?)	Point Lookout North Stradbroke I. (27°26'S, 153°33'E)	-	-
-	26.9.77	Surfers Paradise, Gold Coast (28°00'S, 153°26'E)	-	Drowned in shark net
QM JM7303	17.10.89	Moon Point, Fraser I. (24°14S, 153°00'S)	4.2/♂	Shark attack
QM JM8658	19.7.91	Eagers Creek, Moreton I. (27°07'S, 153°27'E)	4.7/♀	Shark attack
-	3.8.92	Main Beach, Gold Coast (28°00'S, 153°26'E)	-	Drowned in shark net
QM JM12147		Airlie Beach (20°16S, 148°43'E)	-	-
QM JM12148	26.11.97	Butchers Beach, via Bundaberg (24°48'S, 152°27'E)	5.6/♀	-
-	19.7.98	Eurong, Fraser I. (25°31'S, 153°07'E)	4.8/♂	-
QM JM13244	20.7.99	Dilli Village, Fraser I. (25°37'S, 153°05'E)	4.6/♀	-
QM JM13647	26.7.99	Dundubara, Fraser I. (25°10'S, 153°17'E)	3.6/♀	-
-	17.8.99	Cathedral Beach, Fraser I. (25°12'S, 153°16'E)	-	-
-	3.9.99	Grasstree Beach, Mackay (21°16'S, 149°18'E)	4.0	Boat strike
-	26.10.99	Tangalooma, Moreton I. (27°11'S, 153°23'E)	5.8/♂	-
-	4.8.00	South Stradbroke I. (27°45'S,153°27'E)	4.1/♂	-
-	26.6.01	North Stradbroke I. (27°33'S, 153°29'E)	4.6/♂	-
-	25.7.01	Kurrawa Beach, Gold Coast (28°02'S, 153°26'E)	4.7/♂	Drowned in shark net
QM JM14774	30.7.01	South Stradbroke I. (27°46'S,153°26'E)	5.0/♀	-
-	13.8.01	Shoalwater Bay (22°20'S, 150°36'E)	4.5	-
-	13.8.01	Shoalwater Bay (22°36'S, 150°46'E)	~4.0	-

likely to be observed, it is likely that such attacks are an uncommon cause of humpback whale calf mortality in southern Queensland waters.

However, as the humpback whale population increases, numbers of 'attendant' killer whales may also increase. During aerial observations off Point Cloates (22°35'S, 113°40'E) on the Western Australian coast in 1952, when humpback whales were then abundant, at least 130 killer whales were seen on 5 occasions (including an attack on a humpback whale group) between 17 August and 11 September (Chittleborough, 1953). On 24 September 1952 at least 150 killer whales were seen just to the north of Point Cloates in Exmouth Gulf (~22°S) where three humpback whales (including a calf) had been attacked, apparently

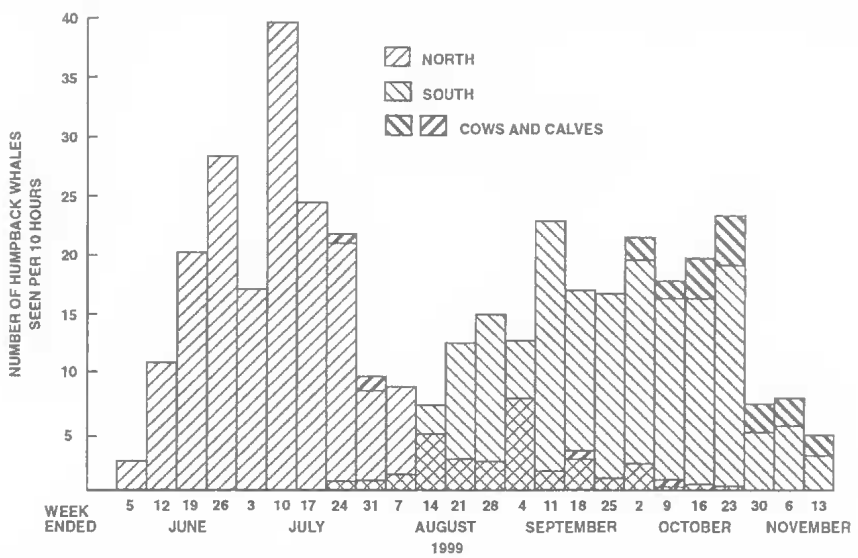

FIG. 1. Numbers of humpback whales seen per ten-hour period on a weekly basis at Point Lookout in 1999.

TABLE 2. Killer whales observed from Point Lookout (PL) and Cape Moreton (CM) during 1978-99.

Date	Location	Number	Direction (N/S)	Attacked humpback whales (Y/N)
1.7.84	PL	~10	N	N
6.7.84	CM	~3	N	N
20.8.87	PL	>5	S	N
19.10.90	PL	?	S	Y
5.8.91	PL	~6	S	N
6.6.98	PL	3	N	N
6.10.98	PL	?	S	Y
10.10.99	PL	~10	S	Y

unsuccessfully, by killer whales in October 1951. Chittleborough (1953) considered Exmouth Gulf was a probable humpback whale nursery area given the high sighting rate of mothers and calves in that region during September and October.

PARASITISM. Although parasitism was not identified as a cause of mortality in these records the following information is considered important. The second largest calf QMJM12148, which was a 'late' (26 November) stranding, was the only one examined to exhibit external parasitism. Numerous barnacles (*Coronula diadema*) were recovered and occasional *Conchoderma auritum* were attached to the *C. diadema* (Fig. 2). The basal diameter of the *C. diadema* varied from 3.1-3.7cm, which is smaller than the majority of *C. diadema* recovered from an 8.1m yearling which stranded at Fraser Island on 3 July 1989 (Paterson & Van Dyck, 1991). The largest in that sample measured 4.6cm and Scarff (1986) recorded *C. diadema* of 5.0cm from adult humpback whales killed during whaling operations off Madagascar between mid-June and mid-August; by mid-September adult barnacles had disappeared and the whales were covered with free-swimming larval barnacles; by early October, small sessile adult barnacles were well attached.

QMJM12148, during its short life (presumably <6 months) spent in temperate waters of similar latitudes to those of Madagascar, had become infested with *C. diadema* which had already grown to a basal measurement exceeding 60% of those recorded from a yearling (Fraser Island) and adult (Madagascar) humpback whale(s).

DISCUSSION

Humpback whales frequent Queensland coastal waters during their annual migration and calf mortalities have been recorded from

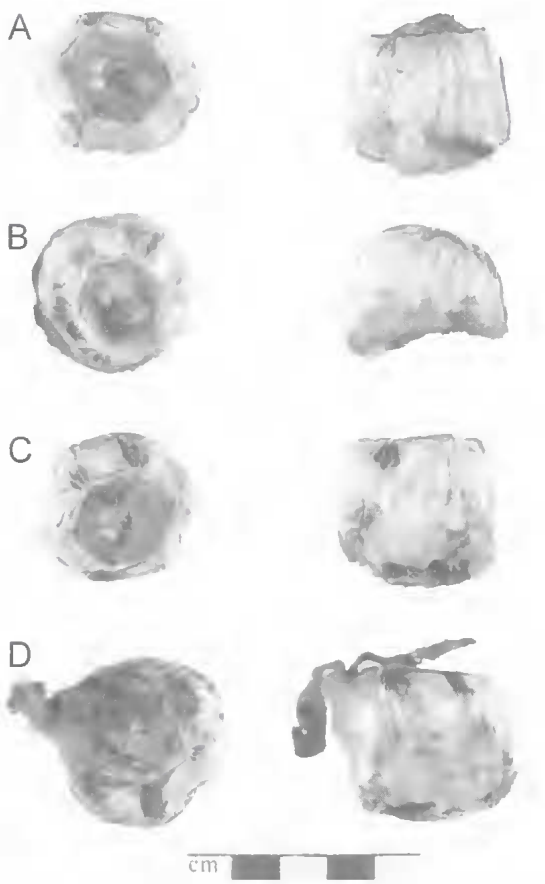

FIG. 2. *Coronula diadema* and *Conchoderma auritum* from a 5.6m humpback whale calf (QM JM12148), dorsal and lateral views. A-C, *C. diadema*. D, *C. auritum* attached to *C. diadema*. (Scale in cm).

June-November between latitudes 20°-28°S with an apparent disproportionate mortality during the northern migration in southern Queensland (Figs 1, 3 and Table 1). Pathological studies on fresh specimens may assist in elucidating the cause(s) of natural mortality in this population now recovering from over-exploitation.

Although the sample is small and presumably under-represents the incidence of calf mortality in Queensland waters, it is of note that human activity (protective shark net drownings and boat strike) contributed to the total. The Queensland Boating and Fisheries Patrol which administers the anti-shark program has been vigilant in recent years in early release of meshed humpback whales and has removed nets from strategic migration paths such as Point Lookout. Consequently, calf mortality from the anti-shark

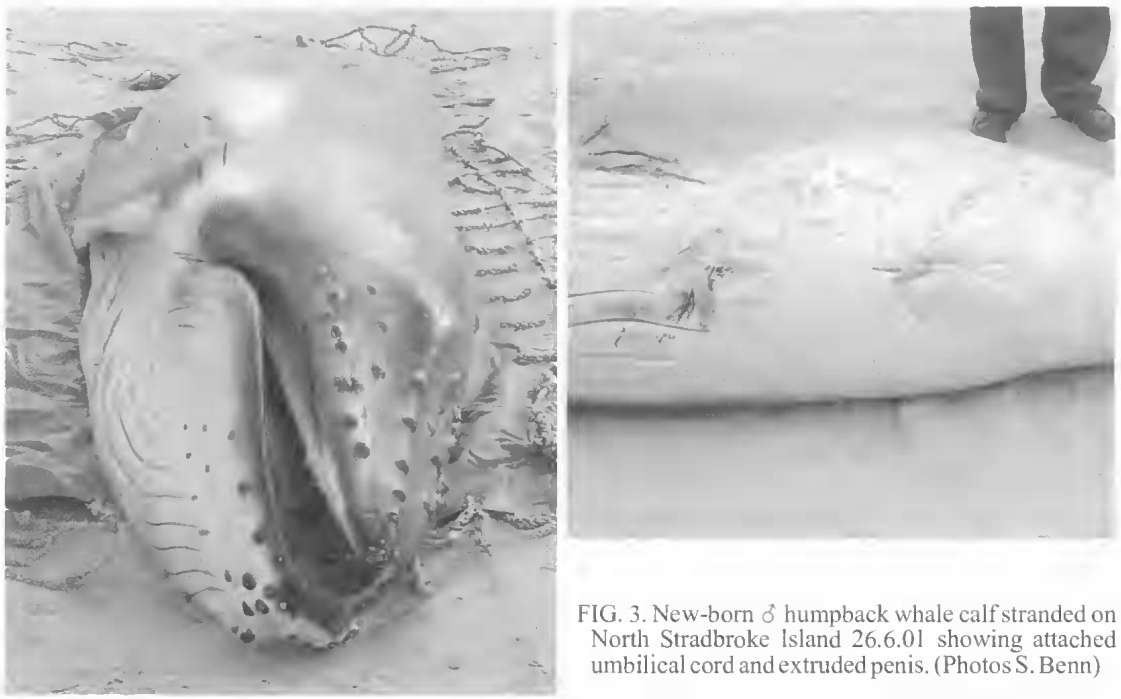

FIG. 3. New-born ♂ humpback whale calf stranded on North Stradbroke Island 26.6.01 showing attached umbilical cord and extruded penis. (Photos S. Benn)

program is likely to remain low. Long-term monitoring of humpback whale calf mortality in Queensland will assist in evaluating factors which may be deleterious to future stock recruitment.

ACKNOWLEDGEMENTS

Officers of the Queensland Environmental Protection Agency, particularly Steve Benn and Steve Winderlich, have assisted in the retrieval of specimens. Their efforts are much appreciated, as are those of Steve Van Dyck who recovered QMJM12148 under trying conditions.

LITERATURE CITED

BRYDEN, M.M., KIRKWOOD, G.P. & SLADE, R.W. 1990. Humpback whales, Area V. An increase in numbers off Australia's east coast. Pp. 271-277. In Kerry, K.R. & Hempel, G. (eds) Antarctic ecosystems. Ecological change and conservation. (Springer-Verlag: Berlin and Heidelberg).

CHITTLEBOROUGH, R.G. 1953. Aerial observations on the humpback whale, *Megaptera nodosa* (Bonnaterre), with notes on other species. Australian Journal of Marine and Freshwater Research 4: 219-226.

1965. Dynamics of two populations of the humpback whale, *Megaptera novaeangliae* (Borowski). Australian Journal Marine and Freshwater Research 16: 33-128.

CORKERON, P.J. & CONNOR, R.C. 1999. Why do baleen whales migrate? Marine Mammal Science 15(4): 1228-1245.

DAWBIN, W.H. 1966. The seasonal migratory cycle of humpback whales. Pp. 145-170. In Norris, K.S. (ed.) Whales, dolphins and porpoises. (University of California Press: Berkeley and Los Angeles).

1997. Temporal segregation of humpback whales during migration in southern hemisphere waters. Memoirs of the Queensland Museum 42(1): 105-138.

GUINET, C., BARRET-LENNARD, L.G. & LOYER, B. 2000. Co-ordinated attack behaviour and prey sharing by killer whales at Crozet Archipelago: Strategies for feeding on negatively buoyant prey. Marine Mammal Science 16(4): 829-834.

MEAD, T. 1963. Killers of Eden. (Angus & Robertson: Sydney).

PATERSON, R.A. 1990. Effects of long-term anti-shark measures on target and non-target species in Queensland, Australia. Biological Conservation 52: 147-159.

1991. The migration of humpback whales *Megaptera novaeangliae* in east Australian waters. Memoirs of the Queensland Museum 30(2): 333-341.

PATERSON, R.A. & PATERSON, P. 2001. A presumed killer whale (*Orcinus orca*) attack on humpback whales (*Megaptera novaeangliae*) at Point Lookout, Queensland. Memoirs of the Queensland Musem 47(2): 436.

PATERSON, R.A. & VAN DYCK, S. 1991. Studies of two humpback whales, *Megaptera novaeangliae*, stranded at Fraser Island, Queensland. Memoirs of the Queensland Museum 30(2): 343-350.

PATERSON, R.A., QUAYLE, C.J. & VAN DYCK, S.M. 1993. A humpback whale calf and two subadult dense-beaked whales recently stranded in southern Queensland. Memoirs of the Queensland Museum 33(1): 291-297.

PATERSON. R., PATERSON. P. & CATO. D.H. 1994. The status of humpback whales *Megaptera novaeangliae* in east Australia thirty years after whaling. Biological Conservation 70: 135-142.

SCARFF, J.E. 1986. Occurrence of the barnacles *Coronula diadema*, *C. reginae* and *Cetopirus complanatus* (Cirripedia) on right whales. Scientific Reports of the Whales Research Institute, Tokyo 37: 129-153.

SIMMONS, M.L. & MARSH. H. 1986. Sightings of humpback whales in Great Barrier Reef waters. Scientific Reports of the Whales Research Institute, Tokyo 37: 31-46.